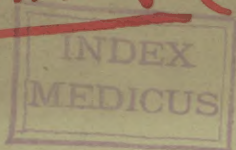


VISCHER (C. V.)



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VESICAL CALCULUS,
TOGETHER WITH
THE PATHOLOGY OF STONE IN THE BLADDER.

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Vesical Calculus—Natural Size.

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UNDER ordinary circumstances, at the present day, one would scarcely be warranted in reporting so common a procedure as opening the bladder through the supra-pubic route, at least not unless the report embodied the results of a large number of consecutive cases; and even then one would feel like offering an apology, as the *sectio alta*, having had its fluctuations, has probably, in the minds of most, found its permanent level.

So it is with no intention of eulogizing an operation which, from experience, is, to my mind, undoubtedly, the simplest and safest method of entering the bladder, but merely to record a case which, to the best of my knowledge, is unique as to the size of the stone.

Dr. White, in the *Annals of Surgery*, reports a case of "Supra-Pubic Removal of an Enormous Vesical Calculus," in which the stone weighed $9\frac{1}{2}$ ounces and measured $8\frac{1}{4}$ inches in its largest circumference. The case I here desire to record is one in which the calculus weighed 10 ounces and 60 grains and measured $9\frac{1}{2}$ inches in the largest and $8\frac{1}{4}$ inches in the smallest circumference, making it the largest stone removed without fragmentation that I could find recorded. There were some points in the history of the case which make it worth reporting in full.

A. W., æt. 33, American, cigar maker by trade. Personal history, as well as that of his family, is negative as pertaining to his illness, save that when a child of 15 he suffered occasionally from a frequency in urinating which was accompanied by some pain and

once by some little blood. These attacks of dysuria were attributed to cold, and treated accordingly, and never affected his general health in any appreciable manner. His habits have always been good, leading, necessarily, a sedentary life. Some three years since he was taken with a very frequent desire to urinate, which was accompanied by more or less pain and some cloudiness of the urine. This was believed to be due to cystitis, for which he was treated as the attacks occurred, until the early part of April, when the trouble appeared in an aggravated form. He came under the care of my colleague, Dr. W. H. Middleton, who at first believed him to be suffering from acute prostatitis. A rectal examination having revealed a large tumor on the right side, which was very sensitive to the touch, treatment directed for this soon brought about amelioration, which, however, was but temporary, the symptoms reappearing shortly very much aggravated. This led to a careful examination, when, on attempting to pass a sound into the bladder, it came to a sudden stop as it reached the prostatic urethra. On carefully guiding it, however, it passed into the bladder, and in doing so revealed the presence of a stone on the right side, which immediately gave the impression as being one of considerable size, it having been fast and immovable. A finger in the rectum at the same time as the sound was in the bladder proved the swelling previously detected to be due to the presence of the calculus. Its removal was of course recommended, and, after the ordinary preparations, effected by way of the supra-pubic route. This method was chosen for the reason that it was believed the stone was of good size and also owing to my preference, it being, without doubt, the simplest, from my own experience, as well as that of my colleagues; its two greatest dangers being more theoretical than real. I have reference to wounding of the peritonæum and urinary infiltration. The former need not be dreaded should it occur, and the latter, with careful drainage and strict attention to cleanliness, although possible, is most improbable. The technique was somewhat out of the usual. The bladder holding but little water, it was impossible to distend it to any extent, and owing to the position of the stone, a sound could not be passed into the bladder sufficiently far to allow depressing the handle so as to make the beak prominent. The bladder was therefore cut down upon without a guide. The peritonæum (unusual in my experience) was found to completely cover the organ. Having carefully dissected it from the under surface of the pubis, it was pushed up out of harm's way and the bladder opened by an incision down on the

stone, which could easily be felt. On introducing a finger and determining the sized calculus, the incision was enlarged downward as far as possible. The stone, which was firmly imbedded in the "cæcal pouch," was dislodged with some little difficulty, when it was found that the bladder opening was too small for its delivery; it was accordingly enlarged upward, care being taken to guard the peritonæum by holding it well out of the way with a finger. Having opened the bladder to the fullest extent possible in one direction, and still being unable to deliver the stone, it, together with the right rectus muscle, was incised laterally to the extent of half an inch, after which delivery was effected.

The manipulations necessitated in removing the calculus were very perceptible on the condition of the patient, who stood the operation perfectly until extraction was attempted, when the pulse immediately began to flag and the patient show signs of collapse. The lateral incision through the bladder and muscle was united by a suture of silkworm-gut, and after thorough irrigation with Thiersch's solution, a modification of Trendelenberg's drain was introduced, and the wound dressed in the usual manner. As previously stated, the patient showed marked signs of collapse, though the procedure was executed with as much celerity as possible, the operation itself lasting twelve minutes and the patient being under the influence of ether twenty minutes.

After some little stimulation reaction set in from which time on recovery was rapid and uneventful, save that there was, with the exception of a very little connective tissue, no sloughing whatever. The wound showed great tendency to rapid repair, the drain was removed on the third day and on the eleventh urine began to pass through the urethra. The wound being completely healed in less than a month, since which the patient has been enjoying perfect health feeling better than for years previous.

A point in the history of this case which at first would seem rather unusual is the almost total absence of cystitis. The urine, at the time of the operation having been perfectly clear on voiding, and after allowing to stand depositing but little mucus, no pus to speak of and some phosphates. At no time was it specially cloudy. This though it at first appears strange, explains itself to my mind, in that, the stone so completely filled the cavity of the bladder that it produced comparatively little irritation. Another interesting point would be the age of the calculus, though it is known that the size of a stone has no relation to its age, in this particular instance there is

reason from the history, and character of the stone, which undoubtedly is uric acid covered by phosphates, that its formation dates back to the period of childhood. In the literature at my command, I was able to find but little as to the size of vesical culculi, save the one already quoted. The largest mentioned as having been removed without fragmentation, range from three to six ounces in weight. Dr. Thomas having extracted one weighing six ounces and Dr. James* removed one from a female which weighed over five ounces.

As to the pathology of vesical calculi we know that as a rule the nuclei are formed in the kidney and are either composed of blood clot or desquamated epithelium, around which the various urinary salts are deposited or they are composed entirely of the salts, principally uric acid. On reaching the bladder they for various reasons may be retained. In that they may be too large to pass through the urethra, or they may be precipitated into a diverticulum or between the folds of the vesical mucosa where their size gradually increases as the solid matter of the urine becomes deposited. At times though less frequently they originate in the bladder itself, when we find the nucleus to be composed of blood clot, mucous, or desquamated epithelium, as those formed in the kidney, or as is more often the case, when the stone is primarily a bladder one the nucleus is formed by a foreign body which has found its way into the bladder, such as a piece of catheter, remnants of dermoid cysts, such as teeth, bone which may reach the bladder through ulcerative processes, gall-stones and the greatest variety of objects. I recall an instance where a hair-pin formed the nucleus of quite a large stone removed from a female. Stones vary in size as they do in variety. They are, however, most commonly found singly, and may range in size from that of a pea or smaller to that of a goose egg, instances having been observed where the calculus formation reached between one and two pounds in weight. The smaller the calculi the more apt are they to be found in numbers, that vary from a few to several hundred. Their form is either round, ellipsoid, or flat; less frequently they have the form of an hour-glass or pipe-stem and still rarer are they angular or faceted, resembling those of biliary formation. In appearance they most commonly present a granular surface, and are of a yellow, brownish-yellow, gray, grayish-white, or black color, much depending on the character of the formation. In

* HAHNEMANNIAN MONTHLY, January, 1891.

consistence, they are all more or less hard, varying from great brittleness to stony toughness. On section it is seen that they are not uniform in their structure, but composed of several salts, which are deposited in one or more layers or strata around the nucleus. It is only exceptional that a calculus is found to consist of a single salt.

We recognize a number of varieties in accordance with their composition. The principal ones being uric acid, phosphate, oxalate, and carbonate of lime, cystine, xanthin, and indigen.

The uric acid stones are possibly the commonest, and are found either singly or in numbers and may be round, oval or flat; the surface presents a smooth polished appearance or it may be finely granular. They are of a dark-brown or reddish color, depending on the quantity of coloring matter that enters into their formation. A polished section shows them to be in concentric layers. At times we find the nucleus composed of oxalite of lime, as also we find in oxalate stones the nucleus consisting of uric acid.

In early childhood and old age stones composed of the urates of ammonia and soda with more or less uric acid are not infrequently found.

These seldom attain a larger size than an English walnut and are mostly round or flat in form, and of a dark-brown or yellow color. When dry they are quite brittle.

Phosphatic calculi are almost, if not quite as common as the uric acid variety, and are composed either of the phosphate of ammonia and magnesia or as happens more often of triple phosphates, with more or less uric acid and oxalate of lime. They frequently have a foreign body or oxalate of lime as a nucleus. The pure phosphatic stone is as a rule not as large as those of a mixed composition. In color they are mostly a dirty white, gray or yellow. The surface is usually granular. On section it is seen that they are either homogeneous or more or less porous. Phosphatic calculi are of a light specific gravity and very brittle. Alkaline urine predisposes to their formation. Stones composed of oxalate of lime occur oftenest in youthful individuals and in some regions are quite common, though as a rule they are less frequent than either of the aforementioned varieties. At times they attain a large size but generally are found to be about the size of a pigeon egg or smaller.

They are usually round in form, with more or less granular surface, which, when marked, has given the stone an appearance not unlike a mulberry, and hence the name "mulberry calculi." They are very hard in consistence, and when mixed with uric acid, as fre-

quently happens, present the hardest variety of vesical calculi. They are also found multiple. On section, they show a striated appearance, and not uncommonly contain several nuclei. In color they resemble phosphatic stones. Carbonate of lime stones, as such, occur but rarely in man, whereas they are commonly found in some of the lower animals. They are usually about the size of an English walnut, of a yellowish-gray color, with an iridescent metallic lustre. Stones formed of cystine are among the rarest, and little is known of their composition save that they are found in connection with cystinuria. They are of a yellow, waxy color, and in appearance more or less smooth. They have been repeatedly found in members of the same family without any inherited predisposition. Xanthin stones are of equal rarity with those of cystine. They are either found to consist purely of xanthin or in combination with oxalates and phosphates. In color they are of a dark brown, with a smooth surface. In consistency they equal those of uric acid formation. In connection with these calculi of rare formation, there yet remain several others to consider. Stones in the most part composed of indigen, which are recognized by their dark bluish color and soft consistency, together with the coloring matter, contain more or less phosphates. Those that are made up of urates, cholesterine, and fat, with a greater or less amount of oxalate and carbonate of lime, have been termed uroliths. Finally, there are the so-called blood-stones, which consist of a coagulum through which has been deposited lime salts. Thompson's statistics of 500 stones show 313 to have been uric acid, 99 phosphatic, 50 with uric acid nuclei and phosphatic covering, 16 oxalate, 9 with oxalate of lime nuclei with uric acid, 6 oxalate of lime with phosphates, 1 cystine, 1 of phosphate of lime, 1 of phosphate and carbonate of lime, and 4 phosphatic, with foreign bodies as nuclei.

The ætiological factors productive of lithiasis are not, in all instances, the same, save that it is essential for many that some organic substance is present which forms the foundation for their further development. This is shown in that urine containing a superfluity of solid matter, either primarily or owing to a change in the urine itself, which acts as a preventative to their solution, does not always give rise to the development of stone, and also as it is known that sediment may exist in the urine without their formation. This is explained by the fact that some organic matter is necessary to their development, and the absence of which may act as a preventative to their formation.

This organic factor must be sought in some diathesis or constitutional anomaly, the result of which is the excessive production of some of the substances that enter into lithic formation, as the uric acid diathesis, etc.

The bladder changes consecutive to stone formation are all more or less mechanical in their nature. As owing to their weight they may cause sacculated conditions, or when possessing a rough surface give rise to considerable irritation and injury to the mucous membrane, and which may also cause reflex contractions of the bladder, which leads to hypertrophy. When small they may become lodged in a ureter, giving rise to the development of hydro-nephrosis. Lastly, they may set up inflammatory changes, either directly through the irritation they produce or indirectly by causing more or less retention of urine, which gives rise to fermentative processes. When the former, the inflammation may take on a fibrous character, resulting in the complete encysting of the stone or in it becoming firmly attached to the bladder wall.

Inflammatory changes frequently precede the actual stone formation, as not uncommonly they are set up by the presence of a small kidney stone, which then forms the nucleus for further development, as has been previously intimated. Calculi of large size from their presence may also seriously interfere with the functions of neighboring organs, as, for instance, by causing pressure on the rectum or uterus. Through ulcerative processes, which at times occur, subsequent to encysted calculi and those found in diverticulæ, they may leave the bladder, giving rise to urinary infiltration, abscess formation, and fistulæ.

